

THE ACADEMICIAN.

VOL. I.

NEW-YORK, SATURDAY, AUGUST 29, 1818.

NO. 10.

PUBLISHED SEMI-MONTHLY, BY ALBERT & JOHN W. PICKET, AT 3 DOLLARS PER ANN.

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NO. XI.

Αὐτὸν ἀγείρουσιν ἢ ὑπερῖστον ἡμῶν ἀλλων.
Still to be first, and rise above the rest.

Stimulos dedit æmula virtus;
Nec quemquam jam ferre potest Cæsare priorem.
Pompeiusve parem.

LUCAN.

'Twas emulative virtue spurr'd them on;
Cæsar no longer a superior brooks,
And Pompey scorns a rival.

If the passions for fame and distinction were extinguished, it would be difficult to find men ready to undertake the cares and toils of government; and few persons would make the exertions necessary to raise themselves above the ignoble vulgar.

REID on the human mind.

"The love of fame is the most active principle of our nature. To be honoured when living—to be venerated when dead—is the parent source of those writings which have illuminated, of those actions which have benefited and dazzled mankind. All that poetry has created; that philosophy has discovered, that heroism has performed, may be principally ascribed to this exalted passion. True it is,

"When fame's loud trump hath blown its noblest blast,
Though long the sound, the echo sleeps at last;
And glory, like the phoenix, 'midst her fires,
Exhales her odours, blazes and expires."*

"Yet as long as man is susceptible of sublime emotions, so long will he commit himself to this master feeling of a noble nature. What would have become of the sublime works of Milton, if he had written for the fifteen pounds which he received from the bookseller, and where would have been the writings of Bacon, if he had not aspired to immortal fame. "My name and memory," said this prince of philosophers, in his will, "I leave to foreign nations and to my own countrymen, after some time be passed over." When with one hand he demolished the philosophy of the schools, and with the other erected a magnificent temple dedicated to truth and genuine knowledge, he was animated in his progress, and cheered in his exertions, by the persuasion that after ages would erect an imperishable monument to his fame.

"But in order that this passion may have its full scope and complete operation, it is not necessary

* Ford Byron.

that there should be a proper subject, but a suitable place, and an enlightened public. The actor, in order to act well his part, must have a good theatre and a respectable audience. Would Demosthenes and Cicero have astonished mankind by their oratory, if they had spoken in Sparta or in Carthage? Would Addison have written his Spectator in Kam-schatka; or Locke his work on the understanding at Madrid? Destroy the inducement to act, take away the capacity to judge, and annihilate the value of applause, and poetry sinks into dulness, philosophy loses its powers of research, and eloquence evaporates into froth and mummery."

The state, as here described, in which a nation must be, was characteristic of ancient Greece and Rome. Their governments, not modelled however, with that mental acumen and political foresight, that the American is, gave free scope to the energies of the human mind. Their freedom was the cause of general knowledge, which enabled the people collectively to estimate the ebullitions of genius, decide correctly upon the deductions of science, and, friends to learning, exalted to eminence, talents which have reflected so much glory on their countries. Had not a value been set on literature, and its votaries rewarded, the sublime flights of Cicero and Demosthenes, would never have had existence; the grave, when it closed upon their bodies, would have likewise covered their immortal writings. It was the desire of distinction that made these countries great, by urging individuals to grand and persevering exertions; it was emulation which realized the greatness of those nations, to which every patriot would wish to see his own elevated.

Our government, alike splendid and solid in its constitutional construction, and guaranteeing liberty to its citizens, is equally fitted to insure to itself, that commanding and glorious attitude, which was once the proud lot of those luminaries of the ancient world. Our soil is as fruitful and productive, and our citizens are possessed of as strong powers of mind, and as athletic forms of body, as any nation that has made a conspicuous figure on the theatre of human action.† The foundation of national great-

* Dewitt Clinton's discourse, delivered before the Literary and Philosophical Society of New-York.

† We almost consider the illiterate invective of some, and the learned spleen of others in Europe, as unworthy of notice. Their calumnies have been often and ably refuted by some liberal minded men on the continent, and some American writers. For information, the reader is referred to Dewitt Clinton's excellent discourse, the United States and England, by James Paulding, Esq. &c.

ness is a virtuous emulation. It was this constitutional stimulant, connected with active intellect, not enervated by the luxuries of refinement, nor distracted by a multiplicity of objects, which exerting itself with ardour, and following up many of its inventions with perseverance, caused the Greeks and Romans to soar to the most astonishing heights of the beautiful and the sublime. To other countries they were doubtless indebted for some rude and imperfect essays of art, science and philosophy; but it was their peculiar glory to shape them into beauty, and methodise them into a system.* The physical and moral features of the American commonwealth correspond to those of Greece and Rome; and active competition, will, undoubtedly place her in the highest scale among nations.

If emulation, which as Dr. Reid observes, is a part of our constitution, produce such beneficial effects among nations, it must of course among individuals by whose exertions a country rises or sinks in distinction. This passion, continually diversified in human society, controuls the exertions of youth equally as much as those of men. The object of emulation is reward, and is the same in maturity as in juvenility; no man contends with a rival without the hope of ultimate victory, and the eulogies of himself and mankind. As powerful as this principle

While we are willing to allow the high state of mental cultivation in England, and that her writers have thrown a veil of national grandeur around her, yet, we are sorry to see a country, famed for its magnanimity and generosity, give vent to its feelings against America in language, calculated in the walks of life, to detract from the merits of a man who arrogates to himself the character of gentleman and scholar, and to place him on a level with the lowest blackguard. While we censure writers who are too much in the habit of aspersing the national reputation of our country, perhaps for national purposes, we do not mean to assert, that this spirit is characteristic of the collective body of Englishmen: It is applicable only to such men as edit the quarterly Review. In England, there are individuals, as in every country, who do honour to human nature, and others who disgrace her. We should rejoice, was there a reciprocity of esteem between the two countries. But we doubt, that this will ever be the case, while animosities are mutually cherished, while Britain continues to assail with acrimony, the physical and mental energies of our soil. Argument is never so conclusive as experiment, and the only way to silence European calumnies, and to prove the falsity of their assertions, is to serve them in the intellectual, as we have in the military contest, that is, *show them our superiority*.

Jealousy of our rising country has no doubt, been one of the chief causes of the temper they have manifested towards us. To individuals who malign America because she is assuming that attitude, which promises a mighty and majestic nation, we would recommend the observations of Reid, on the human mind. "The desire superiority may lead men to undervalue those things

is, in propelling man to action, it is a little strange, that more advantage is not taken of it in the education of our youth.

With these general observations, some of which we anticipated in our last number, we proceed to a few more, after which we shall state the method we have pursued in exciting emulation and rewarding the industrious. Other systems may be devised, and as long as the effect desired, is attained, it is not of great consequence what they may be. Of our own we can speak with confidence, because our wishes have been answered.

SYSTEM OF REWARDS.

This system is designed to encourage learning in American schools, and to enable the instructors of youth to excite and keep up that principle of emulation, which may very justly be termed the main spring of exertion in elementary instruction. Children improve in proportion to the interest they take in their studies, or in other words, in proportion to the emulation excited among them. A reward in hand is a greater stimulus to exertion than a volume of preceptorial admonitions, or the promise of future greatness and honour. Children are naturally impatient and are satisfied only with what they can see, feel or realize. A school currency, therefore, bearing the testimonials of progressive improvement, and in value equal to our circulating medium, would be a powerful auxiliary in the hands of teachers, pa-

wherein they either despair of excelling, or care not to make the exertion necessary for that end. The grapes are sour, said the fox, when he saw them beyond his reach. The same principle leads men to detract from the merit of others, and to impute their brightest actions to mean or bad motives.

"He who runs a race feels uneasiness at seeing another outstrip him. This is uncorrupted nature, and the work of God within him. But this uneasiness may produce either of two very different effects. It may incite him to make more vigorous exertions, and to strain every nerve to get before his rival. This is fair and honest emulation. This is the effect it is intended to produce. But if he has not fairness and candour of heart, he will look with an evil eye upon his competitor, and will endeavour to trip him, or to throw a stumbling block in his way. This is pure envy, the most malignant passion that can lodge in the human breast; which devours as its natural food, the fame and happiness of those who are the most deserving of our esteem.

"If there be, in some men, a proneness to detract from the character, even of persons unknown or indifferent, in others an avidity to hear and propagate scandal, to what principles in human nature must we ascribe these qualities? the failings of others surely add nothing to our worth, nor are they, in themselves, a pleasant subject of thought or discourse. But they flatter pride by giving an opinion of our superiority to those from whom we detract.

* Kett's Elements of General Knowledge.

rents and societies, to awaken, and call into action, the powers of the human mind. A reward of a dime ticket for a child's weekly attendance, improvement and good behaviour at school, would induce a closer degree of attention and punctuality, than all the punishment that could be inflicted. Compulsory measures may make him obedient to the rules of a school; but it is doubtful, whether unnecessary restraint or torture will ever compel him to love his books or his teacher. It is the nature of us all, to love those from whom we receive the kindest and most affectionate treatment, and to hate those who give us pain. Our parents first claim our regard, and were teachers equally kind and affectionate, they would claim our love and gratitude: children cheerfully obey those they venerate: but they will neither obey nor improve under the care or instruction of those they dislike. The grand and almost important study of a teacher then is, to make himself agreeable to his pupils, for without this, all his efforts will be in vain. The great error into which instructors are apt to run is, the using of coercive measures for making children learn their lessons. This although a customary practice is by no means a prudent one. The child looks at his lesson with the same emotion of terror, as he does at the rod; his fears are not dispelled from Monday morning till Saturday night; his school is a prison and the teacher his keeper: both of them are the objects of his hatred. We agree with disciplinarians, that a child should be punished for wilful or malicious obstinacy, till he is humble and submissive, but we do not believe, that the rod ever made a scholar. In addition to this, we are convinced, if entreaties, persuasion, and all means to excite emulation fail, and a child persist in his idleness, that punishment should be inflicted. If it be not checked in some measure, for his own sake, it should on account of the contagion of bad example.

In order that instructors may govern and teach their pupils in a manner more congenial with human nature, and with more ease and satisfaction to themselves, they should avoid as much as possible the infliction of punishment, which may be done in a considerable manner, by introducing rewards and fines. Pay the scholar for every thing he learns or performs correctly, and fine him for his neglect or remissness; when SELF is brought into view, a new era in the child's application commences; he will study hard for *gain*; his whole soul will be called into action, and the fear of losing is a check upon his idleness. The indifference or apparent stupidity which is visible in most schools, is not so much the effect of mental imbecility, as the want of a stimulus or *motive* to exertion. It is as unreasonable to expect children to work without a motive, as it would be to calculate that mankind collectively will labour without the prospect of gain or the hopes of ultimate success. The value of knowledge is not

duly appreciated by children; they cannot estimate the use and importance of education till they have acquired it, or are placed in a situation where the necessity of it is visible; but they can compare the learning of ten or twenty words of spelling with a cent, or the working of twenty sums for a dime.

Almost every necessary of life is estimated by comparing it with our circulating medium.—Thus a pair of skates is worth three dollars; a boy's bat or ball was bought or sold for six cents. By comparing the actual progress which a child is making in his studies with the reward in view, and remunerating him specifically for the accomplishment of the lesson required, is a forcible incentive to future exertion. He would behave well and study hard for *gain* or *honour*; for we are all, whether in a state of adolescence or manhood, under the controul of these. A sense of moral duty, or the benefit of learning, has but little influence on a child's mind. The prospect or hope of gaining that which immediately *enriches* or *honours* us, engrosses our whole attention. We work for pay, and children will study for pay. The same principle to action governs both. A child has the same feelings, the same antipathies, the same passions as a man; his resentments exerted in their little sphere are as fatal as man's; his love of distinction displays itself in his exertions to excel his play mates in their amusements; and, in fact, a child is a man in miniature.

Perhaps some who have not duly considered the subject, or the constitution of the human mind, may object to it, on the ground that it may excite selfish principles* and pervert the real intention of this

* We well know that some consider emulation as fostering the evil passions; and that fame or honour is a shadow which benefits us little. It must be considered, however, that this love of fame has urged the march of the mind from a state of the darkest ignorance and barbarity to the present civilized state of mankind. It is a part of our constitution, given us as Dr. Reid observes, for good purposes, and which under the controul of reason, and restricted within proper bounds in juvenility by habit, by precept, and by example, has been, and will undoubtedly be productive of benefits to the world. Without this, a universal stagnation of business and of improvement would ensue. Take away the motive to act, and the mind becomes torpid. "The mind of man," says Dr. Reid, a celebrated metaphysical writer, and good man, is naturally desultory, and when it has no interesting object in view, roves from one to another, without fixing its attention upon any one, a transient and careless glance is all that we bestow upon objects in which we take no concern. It requires a strong degree of curiosity or some more important passion, to give us that interest in an object which is necessary to our giving attention to it. And without attention, we can form no true and stable judgment of any object.

"Take away the passions," (he is speaking of *emulation* as one of them) "and it is not easy to say how great a part of mankind would resemble those frivolous mor-

grand engine to human improvement. But this effect will never be produced, provided, it is guarded and properly cherished in youth. If those however, who are of that opinion, reflect, that the "labourer is worthy of his hire," and that all classes of society from the peasant to the king, require a compensation for services rendered, they will readily perceive the powerful influence, it must have on the infant mind. The farmer toils in the field for the fruit thereof, the mechanic, rising at sunrise, works the whole day for dollars and cents. Money is the mover to exertion. Take away the hope of profit, or the motive to action, and little labour would be performed.—Pay the industrious scholar, as well as the ingenious artist. Surely learning and knowledge are of importance to society!—Let the student see, that he is rewarded according to his progress, and he will be as attentive on the object of his pursuit, as his parents are in their daily concerns. When this point is gained, emulation is excited; and improvement is secured.

Method of conferring the Reward.

Arrange the scholars into classes according to their advancement, and number them, 1, 2, 3, &c. Let each one in the class have a particular lesson assigned him, and a time appointed for reading or re-

tals, who never had a thought that engaged them in good earnest.

"It is not mere judgment or intellectual ability that enables a man to excel in any art or science. He must have a love and admiration of it bordering on enthusiasm, or a passionate desire of the fame, or some other advantage to be got by that excellence. Without it, he would not undergo the labour and fatigue of his faculties, which it requires. So that, I think, we may with justice allow no small merit to the passion, even in the discoveries and improvements of the sciences.*

The passion for fame is by some decried: even those who seem to think the least of it are the most anxious to obtain it. As the actions of men frequently belie their words, so does the conduct of those who apparently are indifferent to fame. Cicero in his oration pro Archia, observing the vanity of the philosophers who affected praise, at the same time they decried it, uses the figure *derivatio*, when he says of them: *The philosophers and moralists, set their names to those very books, which they write of the contempt of glory; and are desirous to be honoured and applauded for what they say in contempt of honour and applause.*†

Never was there a more correct sentiment; it is founded in human nature. Those who in appearance are the enemies of glory, before they can get what they really do not wish, must first change the human mind. That they can never do; and if so, if the passion for applause or fame were eradicated from their own minds, they would not be so willing to exert themselves to please a congregation of any kind.

* REID ON THE HUMAN MIND.

† WARD'S ORATORY.

citing it. Reward all who perform it well. Determine their places in the classes according to the number of tickets they hold. Pay a dime ticket for a lesson; let this be the certain consequence of industry. When an extra lesson is said, it may be optional with the preceptor, to give such reward as he may think proper.

When the pupil has obtained ten dime tickets,* the teacher may redeem them with a dollar ticket; when he has obtained ten dollar tickets, let them be redeemed with an eagle ticket, which is the highest premium. Let the holder of the greatest number of eagle tickets, obtained during any time specified by the instructor, be rewarded with a gold medal or with books either by himself or the child's parent.

The nominal value of the tickets must be kept up, as every thing depends on their value. By proper management, this circulating medium will pass as currently among the pupils, as bank money among commercial men. The redemption of small tickets for larger ones, adds new motives to exertion. The increase of these tickets increases his application. He stands in his class according to the number he has received.

Were school societies to unite with teachers in distributing suitable rewards among the pupils of our schools, great and beneficial effects would be the result. They would require little compulsion, to induce them to habits of regular attendance and diligent application. Their learning would become a matter of interest, which will urge the mind, not from the ultimate benefits to be derived from learning itself, but from the hope of reward, to a perseverance in the accumulation of knowledge.

This much for pupils.—The teachers of our common schools require a stimulus; the state has it in her power, in addition to what she has already done, to unite the interest and duty of this most necessary class of men. At present, many of our instructors are compelled by absolute necessity to accept of scholars at such low prices as not to support them. Five dollars a quarter is considered a great sum; but where is the man young or old, who can live by it, unless he have a numerous school. It is absurd to expect, that any man of talents will devote his time and abilities to the business without further en-

* Those tickets, (dime, dollar, and eagle,) which we use, bear a resemblance to our best engraved bank bills, and are printed on the best bank paper. They should be signed by the Principals of schools, or the chairmen of the school committees, in the same manner as our bank bills. The plates are engraved in a very handsome manner by Mr. William Hoogland of New-York, who, we are assured by the best judges, bids fair to become one of our first artists. We saw, a few days ago, a specimen of his engraving, which reflected on him much credit. Our Maverick, Murray, Draper, Fairman, & Co.; Kearney, Valance, &c. have already shown to the public the excellence of their manner.

couragement. Men who have, by their application to the study of the sciences and the philosophy of the human mind, qualified themselves in every respect for the important undertaking, will not engage and pursue the calling without greater emolument and more honour. There is not a greater stigma lavished upon our youth's best friends, than the epithet of *schoolmaster*. But why is it a disgrace to be one? Is it disgraceful to teach the *honourable*? If our *pupils* are respectable, we have a right to consider it a respectable profession; but if our *pupils* are *disgraceful*, then the *teaching* of them is *disgraceful*. The honour or disgrace lies mostly with the *parents* or their *children*. No honourable man therefore will run the risk of losing his reputation by engaging in school-keeping; should he do it, it will be the last resort. Want may compel him to it; but he will not take an interest in that which will bring him to disgrace. Hence, this ill-treatment, "has driven many to endeavour to make an academy merely an occupation of profit; to look upon their pupils, not so much as youth to be educated, as instruments of gain; to practise all those artifices, which have been so justly censured; all that delusion, which the people secured to court, and without which they would not be contented. Is it to be wondered, then, that in this case, as in almost every thing human, evils become reciprocally the cause and effect of each other! Unprincipled schoolmasters provoke illiberal treatment, and illiberal treatment makes unprincipled schoolmasters. Is it to be wondered, that so few men of spirit and talents engage in the profession; or that they escape from it, as soon as a decent subsistence can elsewhere be found."*

Hence there are but few competent and worthy men among our teachers. But let an inducement be held out, let teachers be estimated according to their importance, let honour and emolument be attached to the vocation; let the school societies and state governments reward those who shall excel in their professions; let their merits be estimated, and the state reward be conferred in a suitable manner and place, and qualified men will engage in the cause of education, a zealous competition among instructors would arise, redounding to their own credit, and to the benefit of our country.

Among the professions which have exercised the industry of men, there is perhaps, not one, that does not furnish to those who are beginning to practice it, better means of acquiring "its art and mystery" than that of education. It is true, that books importing to be guides to those who are to guide the first steps of the travellers in the path of knowledge, are to be found in every direction—but they are usu-

ally dissonant in their principles and different in the practices they recommend; they seem to acknowledge nothing in common, as the basis of their theories; and are found to have no mutual starting point, for the commencement of their practical course; they are the lame leaders of the blind, and the empiricism and the failures in education which are presented to our eyes by every day's experience, show us that the ditch of disappointment and oblivion is the common fate of the leaders and the led.

To remedy this evil; to build a system of principles, on an analysis of the faculties of man; to deduce from these principles a chain of practical results that shall be applicable to the daily uses of instruction; to form an elementary system that shall improve as the circle of science enlarges; that shall not only be directed to the development of individual talent, but shall "enable the mediocrity of each succeeding age to outstrip the genius of the last;" to bring these stupendous purposes "home to the business and the bosoms" of the professors of education, are at this day, the highest purpose of the most intelligent philosophers, and the warmest wish of the best friends of mankind. The author of one of whose works we now present a partial translation, seems to be among the first who are to distinguish themselves in this course. The particular work from which it is extracted, is a volume of "essays upon instruction," which is added to a very close and extensive course of theoretical mathematics; but the principles which it contains are of every day's application to every day's pursuits—with this remark, we leave him to our readers, to explain for himself the principles which, we should weaken by attempting to anticipate.

Second Section of the "*Essai sur l'Ereignement*,"
par S. F. Lacroix, on the teaching of Mathematics.
Paris, 1816.

Sect. 1.

On the manner of teaching mathematics, and of appreciating, in examinations, the knowledge of those who have studied them.

Every man who is disposed to make his life beneficial to society, should engage in the constant pursuit of a single object; for it is only by a succession of efforts which have always the same direction, that he can ever attain any solid success, and acquire any right to the esteem of his cotemporaries and the gratitude of posterity. Having devoted myself early in life to the labours of instruction, I have always turned my thoughts to the means of presenting the results of science, in their simplest forms, and their most natural order; and this has suggested to me the plan of combining in a single work, all the materials of the higher geometry and analysis. Being called to the duties of a professorship, which I had previously exercised only in schools, where both the form and the matter of instruction were rigidly

* Rev. Dr. William Barrow on Edu.

marked out, and the course to be pursued in the "central schools" being left entirely to the discretion of the master, I was induced by this liberty to reflect upon the means of bringing to perfection the course which had been confided to me. I tried upon a numerous auditory, the principles and methods which I had conceived; their application served to confirm them, and sometimes with a happy modification. From this there resulted some procedures that might have been added to the elementary treatises, but that could not have been described in them, without breaking the thread by which one proposition is united to another. Some of these procedures may have been detailed in conversation, but they have appeared to me sufficiently important to be consigned to a separate volume, which may be considered as the completion of the works already published, and in some manner as terminating the task which I have imposed upon myself. I have dared to hope, that these reflections on the manner of teaching mathematics, and of appreciating the knowledge and capacity of those who have studied them, as they have been suggested by observations made upon myself as well as on the great number of young persons, whose progress I have followed, will not be considered as destitute of use, but will meet the same judgment with the rest of my exertions.

The cultivation of the sciences presents itself in two points of view, which should be clearly distinguished from each other; sometimes, it is but a means of exercising the mind, of developing the intellectual faculties, and of rendering them fit for meditation and discussion; sometimes, also, but unhappily much more rarely than is commonly believed, it furnishes directions and results which are immediately applicable to the uses of life and the wants of society.

When it is considered under the first of these relations, that which constitutes it an essential part of education, none can fail to perceive how important it is to treat nothing superficially, in the objects it embraces, to diminish the number of these objects if necessary, rather than sacrifice to brevity any one of the developements required to reach all the evidence of which the subject may admit, or to explain all the mechanism on which the reasoning may be constructed.

The teaching of the sciences is in this respect subject to the same rules as that of the arts; the choice of examples is far more important than their number; a few truths completely unfolded, throw more light upon the system than a great number of theories which are but partially discussed. From the roots of the first which strike deeply, and seldom fail to extend themselves, spring stems of which the numerous branches are loaded with fruits; the others scarcely rising above the soil, disappear as soon as they have furnished a barren nourishment for vanity.

It would have been superfluous to make these remarks which certainly are without the recommendation of novelty, if men did not need to be incessantly reminded of the most evident truths, when they oppose their habits and their prejudices; but they have been introduced to show the impropriety of departing, in public schools, from that severity of reasoning which develops truths with all the rigour of which they are susceptible; and which borrows from appearances and from sensations nothing but what judgment alone is unable to supply.

Is it necessary for me to add that I am not speaking here of the earliest instructions given to childhood, in which it is usually best to appeal to the testimony of the senses? I shall show hereafter, my opinion of the manner in which a young child should be initiated into mathematics; (In the reflections upon the "Elements of Geometry.") But after he shall have been imbued with the fundamental truths of the science, by a proceeding rather experimental than theoretic, it cannot be dispensed with that he should be made to recommence the study, on principles purely rational, without which there is no such thing as solid instruction. In general, whatever opinion may be adopted respecting the relations which our sensations bear to our ideas, and the means that we have within ourselves of adding to their stock, I think it can hardly be denied, that the master should endeavour to make his pupil* retrace the progress of his mind, as soon as he shall have acquired a sufficient number of external notions, to be compared together, and that the period of commencing, and the time to be devoted to this course, should be measured by the age of the pupil, and the number of facts he may possess.

I then declare, that I lay out of this discussion whatever regards the preparatory knowledge that makes a child capable of application; I confess my ignorance of the manner in which the ideas of number and of magnitude are acquired; and I limit myself here to an inquiry into the mode, by which, with these materials already wrought by a preliminary education, however empirical, pupils of fifteen or sixteen years of age may be made to comprehend the elementary theory of the mathematical sciences, and the forms of the methods which are peculiar to them. It may perhaps be said, that this would be fixing rather a late period for the commencement of this study; and I acknowledge that I have met with those whose powers were of an earlier growth. But these exceptions are nevertheless too few to affect the general application of the rule; it is delightful to believe that they will become less rare, when early education shall have reached a higher state of improvement; but until then, I must adhere to the opinion which has been suggested to me, by the most frequent observation.

* *Ramener en lui meme, To lead him back in himself literally.*

It will not perhaps be considered irrelevant for me to dwell a little longer upon the idea which I have formed to myself of public instruction, and to repeat, that it is the interest of society and not of individuals, which should regulate its course; for, the former demanding that the mass of intelligence should be increased, and above all, that the distribution of labour should be directed to the improvement of the faculties, if not rigorously (for that is impossible) at least, in an approximating course; it is essential, as I have already said, that the instruction should be sufficiently profound to exhibit talent, to enlighten it respecting its vocation, to point out the route it should pursue in its progress towards perfection, and severe enough at the same time to avoid that mediocrity of occupation, which will always be heavy and barren in its hands and to direct it to such labours as will render it useful to the world. This testing, and if I may be allowed the expression this assortment of intellect, is among the best fruits that society can reap from the advances it makes for education.

There is then but little reason to fear, that in the central schools and in the books devoted to the use of these schools, the teaching of mathematics should be made too abstract. Notwithstanding, as every thing is liable to abuse, certain limits should be traced, beyond which, on one side as well as the other, will be found that exaggeration, which gives birth to nothing but chimeras. This fault could not be avoided, if it were thought that to follow a severe method, is to tie ourselves down perpetually to minute formalities, the remains of the jargon of the ancient schools; that it is to drone over details purely metaphysical, that it is to be refining upon notions the most clear, and to obscure by superfluous proofs, that which is evident of itself.

For the Academician.

Munus et officium, nil scribens ipse, docebo.

Hor. de Art. Poet. l. 306.

THERE is scarcely a subject upon which more learning has been expended and more talent exercised, than that of criticism, and, perhaps, if a just estimate be formed of the effects that works of literary genius may produce upon the individual character of man, the political condition of a nation, or the intellectual aspect of an age, the code by which these works are to be judged deserves the encomiums which it has acquired through the merit of many of its professors.

From the earliest appearance of those works upon which the powers of criticism are employed, its principles have been attempted to be developed and its laws to be settled, by men of every rank in life, and every grade of intellect. Its professors have

shrunk at one time into the cells of poverty, and at another have stood in the courts of princes; they have been found alike in the garrets of Grub-street, the purlieus of Paris, and the palaces of Anne, Elizabeth, Louis, Zenobia, Augustus, and Alexander. With Zoisus and Dennis they have attempted to diminish the glory of the beams that were too brilliant for their sight to sustain; with Aristotle, Horace and Addison, they have laid bare the roots from which the stems of the science spring; with Longinus, La Harpe and Johnson, they have removed the veil, which concealed the ark of the mysteries of genius, and, there is scarcely a shape for the communication of instruction from the most rigid syllabus of philosophical principles to the widest induction and the closest examination of particular instances, that they have not at different times given to its maxims. From a diversity like this, it would not be unreasonable to expect some clashing in the principles which are made the basis of this science, but the fact is otherwise. Nature, who never differs from herself, has been their source, and the common sense of mankind which is in all ages the same, has been the test by which their purity has been tried; the inevitable consequence has been, that nothing new has resulted from the efforts of the multitude of minds that have treated it as a science, or practised it as an art, and the only difference to be discerned between the precepts of Aristotle, Horace, Boileau and Pope, is in the various forms and languages in which they are delivered. It is true, that the denial of this position may find some plausibility in the local and temporary diversities of opinion on the various subjects of literature, but those diversities result not from any difference in principles, but from doubts respecting their application, and produce no more change in the certainty of the science than the arguments of the bar do in the rectitude of justice, or the jarring of sects, in the stability of the faith. The observation, however, of these partial differences should make us cautious how we desert the fountain of the science, for the streams that flow from it in such variety and abundance.—To copy Homer, is certainly to copy nature, but it is to copy her at second hand; with the statue within our reach, we should not imitate the model, which however perfect in its resemblance, must still want something of the mellowness and finish of the original. With the universe before our eyes, we should hardly judge of the wonders of creation, from the exhibitions of the museum or the cabinet, however complete the collections, or however rare the specimens they might furnish.

In examining the works of genius by a particular rule of criticism, it should never be forgotten that the principle upon which the rule is founded, must be kept perpetually in view. It was the misapplication of a precept in Horace that prevented Huet and Le Clerc from seeing, as Longinus saw, the simple grandeur of that sentence of Moses which is almost

the first in sublimity as well as in time, that has ever been composed.

But the advantage of criticism as a system of rules for the attainment of the excellencies of composition must necessarily, from the nature of the art, and of those who are to practise it, be exceedingly limited. Of the five sources of the highest merit of composition which Longinus has enumerated; the first two* which serve as a foundation for the rest, he asserts, are "beyond the reach of art," and to be derived only from natural endowment. Besides, if the rules of the science were to be reduced to a form so practical as to make success in the art the sure reward of diligence, the gain to the world would not be so great, as at first, might be readily supposed; for, the labour of acquiring and applying the rules would be such, that, perhaps the number of those who are destined to delight and to instruct mankind would not be much augmented; and, if it were, man would hardly find leisure to contemplate their excellence—The stars within the reach of our unassisted vision are enough to excite emotions of wonder and sentiments of piety, which can never be much increased by the sight of the myriads with which the telescope tells us that the firmament is filled.

If then the power of educating the faculties to invention be denied to the science of criticism, in what are its claims to utility and dignity to be allowed? in what, but in unfolding the sentiments and laying bare the thoughts with which the works of genius are crowded; in shedding over them a light that shall make them evident to every apprehension; in preparing the mind for their reception; in strengthening and deepening the impressions that they may make; in teaching men to think while they feel, to reason while they glow; in shewing them how to distinguish the steady light of truth from the meteoric gleams of falsehood—that thus—as it guards the mind against the seductions with which the paths of literature are filled, and facilitates its passage in the narrow way of rectitude and taste, it may add strength to thought, purity to sentiment, impulse to virtue and ardor to religion—It is to some, or to all of these purposes that it has been directed by those princes of the art, Longinus, Addison and Johnson—and as long as the principles on which they have treated it be kept in view, it will hold its

* προϋποκειμένης, ὡς πρὸς ἀνεξετάστου καὶ ἀνυποτάκτου, τὰς πέντε ταύταις ἰδέαις, τῆς ἐν τῷ λεγέειν δυναμείας, ἢ ὡς ἡ χάρις οὐδὲν—τὸ πρὸς τὰς νοήσεις ἀδρεπῆστον, —τὸ σφοδρὸν καὶ ενθουσιαστικὸν πάθος ἀλλ' αἱ μὲν δύο αὐταὶ τε ὕψος κατὰ τὸ πλεον αὐθιγῆς συστάς, αἱ λοιπαὶ δ' ἡδὴ διὰ τέχνης.

Long. de Sub. Sec. 8.

The common foundation of sublimity, without which it cannot exist, is, a natural force of language. Its first and most powerful source is boldness of thought—its second, strong, sudden and enthusiastic feeling. These two result for the most part from natural constitution, but the rest are derived from art, &c.

standing among the proudest of those pursuits which are intended to inform, to benefit and to dignify mankind.
T. T. P.

NATIONAL WORK.

WE cheerfully give the following insertion in our journal. Our exertions shall always be directed to aid and promote all societies, that may have the interests of the public in view. We were initiated into the views of Dr. Lyman Spalding some time since, and as far as we were capable of judging, we deemed the plan a good one. Its success has our best wishes, and, we entertain little doubt, that it will ultimately be carried into execution. If talents will insure its introduction among medical gentlemen in the U. States, we are sure that this work will not be deficient in medical ability.

While we are upon this subject, we may observe, that the profession of medicine which is dignified in itself, and so useful to man, when understood, and the duties enjoined by it, practised, that we think it behoves our medical committees, appointed to examine students for admission to practice, to be more rigid in their procedure. The lives of men are valuable to themselves, their families, their friends and society, and it is dangerous to trust that sacred gift to the hands of unskilful men. Quack physicians people graves by their unskilfulness, almost as fast as the most fatal diseases. Οὐκ εἰμι ἀνοήτ' ἔδωκε τολμήσο' ἔπος, says Menander. Nothing is more daring than unskilfulness. It is an infringement on the laws of the land, and the lives of our citizens to turn into the world beardless boys, who have a little theoretical knowledge of medicine. No men respect a capable and conscientious physician more than we, and no men more heartily despise the pestiferous quack in this or in any other profession. Empirics in medicine are as dangerous to health of body, as quack pedagogues to soundness of mind. Our committees are too remiss in their examinations; persons of no abilities are admitted to practice in this, as well as in law, and even divinity. It would be to the honour of professions, were the laws severe, and enforced without distinction of applicants. It would exclude many who were never designed to exchange the hoe or the pick-axe for the pestal or mortar, or hasten men from life into eternity.

About two years ago, we were knowing to the following circumstance. A student of medicine appeared before the examining committee; a letter was handed to them by him from the gentleman with whom he had studied; begging the committee "to be a little easy" with the student, who passed a most miserable examination, and yet was admitted to practice!! The committee were of that opinion, but that committee and that doctor were intimate friends. "Kissing" they say, "goes by favour."—It is high time,

that these insignificant insects who buzz about and are only known when they sting, are banished from the social circle, and doomed to a just oblivion and contempt.

These observations are made not to injure any medical gentlemen, but to excite the committees, and those who have students under their care, to be strict in examination and careful in the discharge of their duties. Our school committees too in the various states, (and much is said upon this subject in the New-England papers) are very far from performing the charge committed to their care.

In the New-York Medical Repository, New Series, Vol. 4. Nos. 2. & 3. is a dissertation on the medical character by Thomas D. Mitchell, M. D. in which are many excellent observations. We would refer our readers to that excellent work, which depicts the true character and duties of men engaged in that profession. Its scientific essays are very interesting and instructive.

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From the Boston Daily Advertiser, July 2.

A National Work.—In January, 1817, Doctor Lyman Spalding submitted to the New-York County Medical Society, a project for the formation of a Pharmacopoeia, by the authority of all the Medical Societies and Medical Schools in the union. The work, however, was not to be undertaken unless it should meet the approbation of the majority of the aforesaid institutions.*

The plan proposed by this eminent member of the profession was, 1st. That a convention should be called in each of the four grand divisions of the United States, to be composed of delegates from all the Medical Societies and Schools. 2d. That each district convention should form a pharmacopoeia, and elect one or more delegates to meet in convention in the city of Washington—and 3d. That the general convention should, from the district convention pharmacopoeias, form the national work.

This plan has been so far carried into execution, that circulars have been issued to the medical societies and schools, inviting their co-operation. And we are happy to learn that all those institutions which have had meetings, have approved of the formation of the work, and appointed their delegates. We may therefore safely congratulate the American public on the speedy formation of this important national work;—the first in America, if not in the world, which has been got up under the authority of the profession at large. Our love of country will not suffer us to omit hinting at the tendency, which a work formed in this manner, must have in giving us a national character.

* On inquiry we learn, that the approbation of only four other societies or schools is wanting to make that majority.

PHILOLOGICAL DEPARTMENT.

GRAMMAR: Continued from page 141.

SECT. VIII. cases.

THE variations and exceptions to general rules which are so often practised in the use of the cases diminish their importance in the doctrines of universal grammar. Such distinctions as they imply might have been in most instances dispensed with. The discussion of them partakes more of the character of an inquiry into the conjectural history of particular dialects, than of an investigation of the radical principles of language; and the length to which that discussion sometimes extends is due rather to the difficulty than to the importance of the subject.

The *Genitive* case, though sometimes governed by a verb, as by the verbs *potiri*, *fungi*, *meminisse*, and *angi*, sometimes by an adjective, such as *similis*, appears to have been originally applied in the Latin language to signify a relation betwixt the idea expressed by a noun and that contained in *some other noun* in the same sentence. The English preposition *of* corresponds so exactly to it, that any observations made on the one are equally applicable to the other. Attempts have been made, both by means of etymological derivations and explanations of existing phrases, to represent the word *of* as signifying some specific relation, as, for example, possession or origin. These attempts, however, have failed. We find it expressing every sort of relation that can exist between the ideas contained in two nouns. This circumstance implies no ambiguity. It arises from the mere generality of the sign. When it is too general for expressing our meaning, we add some more specific ideas. In the article GRAMMAR of the *Encyclopædia Britannica*, it is justly observed that *injuria regis* may mean either "an injury inflicted by the king," or "an injury received by the king." The specific idea intended to be conveyed, must either be inferred from the connection, or pointed out by some additional sign.

The genitive case, though thus general, and supposed by some to have in the Greek language derived from this circumstance its technical name *παραθετικὴ γένεσις*, ought not perhaps to be considered as more general than others. It is distinguished from them by the circumstance of being employed to show that the word put in this case is subordinate to a noun. Nothing more than a general relation betwixt the two ideas is expressed; but the connection thus established has something particular in its adaptation to the purposes of discourse. The ideas thus connected could not exchange places, nor are they of equal importance in the sentence, as they

would be if conjoined by means of the word "and." "The man of virtue" and "the virtue of the man" do not mean the same thing. The ideas expressed by the words man and virtue are indeed connected in both of these phrases; but when we say "a man of virtue," it is intimated that something further is said of "the man." When we say "the virtue of the man," it is intimated that the subject on which we enlarge is "the virtue." Both of these are different from a connection formed betwixt two nouns by the word "and;" which intimates that they are on equal terms in the assertions which are made.

Such instances as we mentioned of the genitive being put after verbs and adjectives are so rare, that they may be considered as exceptions in which a stretch is made to give those governing words the power of nouns in the use of language. Every word resembles a noun in containing the name of an object or an idea. It is only in relative importance in the syntax of sentences that nouns differ from other parts of speech.

Exceptions of a different kind are also found. Nouns are in some instances annexed to other nouns by marks different from those which form the genitive; e. g. *homo a secretis*, a Latin phrase for a "a secretary;" and in English we have the phrases "father-in-law," and "cousin by the mother's side." This last phrase is seldom employed without the use of the verb *is* preceding it, which gives a different turn to the whole phraseology, and has the power of introducing a greater variety of words than can be annexed solely to the noun. Such exceptions as we have now mentioned are equally rare with the former; a circumstance which shews the nature of the genitive case to be almost peculiar.

In the Hebrew language, the placing of one noun after another is often the only sign of the genitive. *Jein* signifies wine, *Helbon* is the proper name of a mountain, and *Jein Helbon* is the expression for "wine of Helbon." Sometimes it is expressed in a manner which must appear remarkable to those who are not acquainted with any analogous language. The change indicating this mode of annexation is made on the governing noun, which is then technically said to be in its *constructed state*, while the noun in the genitive case undergoes no change. *Dábar* signifies word, and *Elohim* God; but there is no separate word for *of*, nor is any change made on *Elohim*, to make it equivalent to "*of God*." *Dábar* is put in its constructed state by being changed into *debár*, which signifies *word of*. *Debár Elohim* is "word of God." In like manner, *gedolim* signifies "great men," *haghír* "the city." Great men of the city is not *gedólim haghír*, but *gedólei haghír*.

In English, as has been already observed, the

genitive case is sometimes expressed by the termination *s* with an apostrophe, as in the first line of *Paradise Lost*, "Of man's first disobedience, and the fruit." It is thought by some grammarians an improvement in nomenclature, to call this form of the noun an adjective of possession derived from the noun. This distinction makes no difference of doctrine. That mode of describing it seems to have been unconsciously suggested by the circumstance of its being, like the adjective in English, placed before the noun to which it is subordinate. But nothing more than the meaning of any genitive is signified by the adjective noun itself, as will appear when we come to treat of it. The English *s* has, with regard to its etymology, been considered by some as an abbreviation for *his*. But this (or the equivalent syllable *is*) is evidently an original sign in our language, at least independent of such words as *his*; and the latter is evidently derived from the pronoun *he* by having this sign attached to it.

The genitive case is sometimes expressed in English, as it is in Hebrew, by the mere juxtaposition of the nouns, with this difference, that the governed is placed before the governing noun; as in cart wheel," "corn field," "garden wall." Some of these phrases are of more frequent recurrence than others. Sometimes the two words thus conjoined have, both in spelling and pronunciation, been run together into one, as in "timepiece," "statesman," "footman." Others of them are frequently connected in writing by a hyphen, to denote that they are scarcely to be considered as one word, yet not so much separated as two words generally are. In other instances, they are kept as distinct in a sentence as any other words. The meaning is not affected by this variety, and is so clearly expressed by simple juxtaposition in this order as never to admit of ambiguity. Here we have one fact, by the consideration of which any inordinate predilection for the individuality of words may be reduced within just bounds.

The chief ultimate purpose for which the genitive case is employed is, to add a particular circumstance for completing the description of an individual, or of a species of objects, already characterised by a term which is in itself too general for the purpose. "Man" is a general word. "A man of genius," "a countryman," are instances in which the genitive is used to point out a relationship for designating a limited species contained in the genus "Man." This may be done when an individual, or a species, is introduced as the subject of discourse; as, for example, "A man of genius differs from other persons in his feelings and habits;" or it may be introduced into the predicate of a sentence, and form a part of some new assertion, as, "Bacon was a man of genius."

The other cases are distinguished from the genitive, by denoting an annexation to some part of speech different from the noun.

The *Accusative* and *Dative* have by some been considered as very nearly alike. By others some differences have been stated betwixt them, depending on differences in the objects, motions, or relations, represented by the governing word. Attempts of this last sort have proceeded on principles which served to explain a limited set of phrases, while they were totally inadequate to explain others.

The most obvious circumstance which distinguishes the *Accusative* case in Latin from the genitive is, that it is governed not by nouns, but by active verbs and certain prepositions. It is by attending to the different occasions on which it is employed, and tracing the properties which uniformly adhere to it, that we shall make the most convenient approaches to an explanation of its use.

Sometimes it represents an object to which some action or motion passes, or in which it terminates, as *Hæc studia adolescentiam alunt, senectutem oblectant*. This character, however, has been ascribed to the accusative in phrases in which it will not apply. When the verb "to love" governs the noun signifying the object of that affection in the accusative, it expresses no transition of an act. The person who is loved may be ignorant of this passion, and totally unaffected by it. When we speak of "loving all mankind," we do not speak of any action which terminates in that extensive range of objects. This remark applies to all transitive verbs, expressing emotions of mind that have a reference to external objects, as "to hate," "to dread," "to respect," "to esteem." These affections may be productive of acts by which the objects of them are affected, but such acts are not implied in the affections themselves. They are excited by the objects named in the accusative, but they terminate in the individual mentioned in the nominative. To represent them as terminating in the beings called their objects, is a mere fiction: it applies only to the range of ideas of the individual mentioned, not to the actual relative energies of the different objects. Some other verbs governing the accusative are expressive of quiescent qualities, which do not affect any object different from that to which they belong. Yet these qualities imply a reference to other objects, and the mention of this reference is absolutely necessary. These other objects are put in the accusative case. Such are the verbs "resemble" in English, and *similare* or *simulare*, and *referre*, when used in that sense in Latin. Here, as no transition of any act or motion from one object to another takes place, the accusative cannot be considered in any respect as expressing

such a transition. It will give but little satisfaction to say in reply, that, though nothing of this kind exists, yet it is figured in the speaker's mind, and that even in such a proposition, as this, "a benevolent man loves the whole human race," we imagine a benignant emanation proceeding from the benevolent man to influence the whole species. This is an evasion of the argument. It is in like manner an evasion, rather than an explanation, to say that a person who asserts that one man "resembles" another, seems to consider such a man as influencing the state and relations of the other. This is an unconscious acknowledgment that the conceptions of the speaker, or the transitions of his thoughts, and the transitions which he studies to produce in those of the hearer, are the foundation of the use of the accusative case. This is the view which we consider as on all occasions the true one. Such mental transitions have a certain degree of rapidity, which corresponds more closely with the idea of an action terminating in an object named, than with the greater part of our associated ideas. On this account the regimen of the accusative case is more frequently applied to signify these than any other trains of thought.

When the accusative is governed by prepositions, these prepositions prepare us for a transition equally rapid with that of the active transitive verb. In order to shew that this regimen does not depend on the *idea expressed* by the governing word, we shall take this opportunity of stating a circumstance, which might otherwise appear an anticipation of our observations on the verb: to wit, that some verbs, which are completely synonymous in the ideas which they express, are totally different in the transitions of ideas which they are intended to create in the mind of the hearer. The Verbs "to speak," and "to say," signify precisely the same act. Their difference consists in this, that the verb "to speak" does not intimate an intention to state what was spoken, but the verb "say" always does. When we say "Cicero spoke," we may probably rest satisfied with mentioning the act in connection with the agent. Our hearer may, if prompted by curiosity, ask what Cicero said when he spoke? But, if we use the phrase "Cicero said," we pledge ourselves to give some account of what he said, or to subjoin the accusative of some noun, such as the word "nothing." If we do not proceed further than the words "Cicero said," the person who hears us asks the question now mentioned in a different tone: he reminds us that we have stopped short in our discourse, and have not fulfilled the promise implied in the use of the verb "to say."

The *Dative* case might easily receive a plausible explanation in a large proportion of phrases in which it is employed. But a difficulty has arisen,

in consequence of the approximation which some of its uses seem to make to that of the accusative. Some verbs which govern the accusative are synonymous with others which govern the dative. An example of this exists in the verbs *ludere* and *nocere*. *Antonius nocuit Ciceroni* is equivalent to *Antonius læsit Ciceronem*. But though the phrases are synonymous it is possible that the words of which they respectively consist are not equivalent. It is possible that in one of the phrases a greater share of the meaning may be contained in the verb, and less of it in the governed noun. This is rendered probable from one circumstance, that there are no verbs which admit of either case indiscriminately, so as to form with them two synonymous phrases.

We ought first to attend to those phrases in which a verb governs one noun in the accusative, and another in the dative. This may be a verb of giving, as in *Dedit mihi dextram*, or a verb of declaring as in *Narras fabulam surdo*. One difference seems here to take place, that there is a more ready and rapid transition to the idea expressed in the accusative, than to that expressed in the dative; and the idea which is expressed in the accusative is more necessary to the completion of a significant phrase than the other. *Dedit dextram*, and *narras fabulam*, though both evidently incomplete sentences, are not quite so deficient as *dedit mihi*, or *narras surdo*. The verb is so contrived in the arbitrary application of words, as to lead the hearer to expect with greater rapidity and impatience the idea which is subjoined in the accusative, than that which is in the dative. When the dative is placed first in order, as in the phrase *dedit mihi dextram*, we are sensible of a degree of inversion, or a short suspension of the governed word most nearly connected with the verb. This mode of speech is contrived for the sake of variety and elegance, or for the convenience of dwelling on the idea expressed in the accusative, by attaching to the noun some additional parts of speech; as, *Narras mihi fabulas gigantum incredibiles*.

In the use of verbs of giving and declaring, a difference in the actual relations of the object mentioned in the accusative and that in the dative case is evident; but in verbs of comparing no difference of this sort is necessarily implied. The sentences, *Compare Virgilium Homero*, and *Compare Homerum Virgilio*, may be used for conveying the same meaning in exactly the same manner as to thought. The interest taken in one of the objects compared may not be greater than that taken in the other, and the transition made to the two may be equal in its degree of rapidity and deliberateness. At the same time, if there is any such difference of interest, it seems natural to put that object to the description of which the comparison is principally subordinate in the accusative, and the other in the dative.

These facts may furnish some illustration of those phrases in which a verb governs the dative case alone; for example, the verbs *nocere*, *favere*, *placere*, and *resistere*. The English verbs into which these are translated are equally transitive, and govern the same form of the noun, with those which correspond to Latin verbs governing the accusative. But in the Latin language it is probable that they are not so completely transitive, and resemble in their genus those English verbs to which nouns are subjoined through the medium of the preposition *to*, as the verbs "yield," and "submit." Thus the translation of *obedire* by the verb "submit" would be more accurate than by "obey," in so far as regimen is concerned, although the former of these English verbs, as applied to the expression of ideas, may be less nearly co-extensive with the Latin word. It is conceivable that a verb, which is originally not used transitively, may be more easily made to govern the dative than the accusative, whether it is employed in its simple state, or in composition. The verb *resistere*, for example, is derived from *sis-tere*, which signifies to stop or remain fixed, and does not prepare the hearer to expect the mention of any other object affected. This state, however, admits of being also mentioned as an impediment to the progress of another. The name of this other may be subjoined with a slight degree of ceremony; and a semi-transitive verb may be formed signifying that fixed state, together with an intention of mentioning the object impeded. The machinery of prepositions or other intervening words, for the introduction of the latter object, is dispensed with; yet the verb is made to govern a case which implies some slight degree of ceremony in the mental transition intended.

ARITHMETICAL AND MATHEMATICAL DEPARTMENT.

Continued from page 142.

MULTIPLICATION.

When the numbers to be added among themselves are equal, the addition takes the name of *Multiplication*; because the amount is then composed of one of these numbers repeated as many times as there are numbers to be added together; reciprocally then, if a number is to be repeated several times, it can be accomplished by adding the number to itself, once less than the number of times, that it is required to be repeated; For example, in the following addition--

16
16
16
16
—
64
—

The number 16 is repeated 4 times, and is found to have been added 3 times to itself; to repeat a number twice, is to *double* it; 3 times is to *triple* it; 4 times is to *quadruple* it; and so on in succession.

Every multiplication is expressed by three numbers, viz. the number to be repeated, which is called the *multiplicand*; the number shewing how many times it is to be repeated, which is called the *multiplier*; and the result of the operation which is called the *product*. The *multiplicand* and the *multiplier* considered as concurring together to form the *product* are called *factors* of this product; in the preceding example, 16 is the *multiplicand*, 4 the *multiplier*, and 64 the product, and it is plain that 4 and 16 are the *factors* of 64.

When the multiplicand and multiplier are large numbers, the formation of the product by the repeated addition of the multiplicand would occupy a very considerable time. It has therefore been sought to abridge the operation, by distributing it into a certain number of partial multiplications which are easy to be effected in the memory. The number 16 for instance can be repeated 4 times, by taking separately as many times, the 6 units and the ten of which it is composed: it is enough then to know the products of the numbers of units of each rank in the multiplicand by the multiplier, when this latter number has but a single figure; and that resolves itself, in every possible case, into finding the product of any one of the 9 first numbers by every other of these numbers.

These products are contained in the following table, attributed to Pythagoras.

TABLE OF PYTHAGORAS.

1	2	3	4	5	6	7	8	9
2	4	6	8	10	12	14	16	18
3	6	9	12	15	18	21	24	27
4	8	12	16	20	24	28	32	36
5	10	15	20	25	30	35	40	45
6	12	18	24	30	36	42	48	54
7	14	21	28	35	42	49	56	63
8	16	24	32	40	48	56	64	72
9	18	27	36	45	54	63	72	81

To form this table, the numbers 1, 2, 3, 4, 5, 6, 7, 8 and 9 are first written upon the same line; each of these numbers is afterwards added to itself; and the sum is written on the second line, which is then found to be composed of the double of each number on the first, or of the product of each number by 2.

The seven numbers on the second line are added in the same manner to the corresponding numbers on the first, and the sums are placed upon a third line, which contains the triple of each of the numbers on the first, or their products by 3. By the addition of the numbers on the first line with those on the third, there will be formed a fourth which will contain the quadruple of each number on the first, or the product of this number by 4, and so on, in order, to the

ninth line, which contains the products of the numbers on the first, multiplied, each of them, by 9.

It is worth while to remark that the several products of any number, by the numbers 2, 3, 4, 5 &c. are called the *multiples* of this number; thus 6, 9, 12, &c. are the multiples of 3.

When the formation of this table is correctly conceived, the use of it is easily understood. If, for example, the product of 7 by 5 were required, it would be necessary, on the fifth line which contains the different products of the nine first numbers multiplied by 5, to take that which answers above to 7: this will be found to be 35. The method in every other example will be the same: *The product is found in a line with the multiplier, underneath the multiplicand.*

In seeking in the table of Pythagoras for the product of 5 by 7, there will be found again as above 35, although this time 5 has been considered as the multiplicand, and 7 as the multiplier. This observation, which may be repeated upon each one of the products contained in the table, is general; and, in any multiplication whatever, the order of the factors may be reversed, that is, the multiplier may be taken for the multiplicand, and the multiplicand for the multiplier, without affecting the result.

As the table of Pythagoras contains only a limited number of products, it would not have been enough to verify in this table the conclusion that was declared above; for the truth of it might be doubted, with respect to greater products of which the number is unlimited: there is nothing but a reasoning independent of every particular value of the multiplicand and multiplier which can shew that this conclusion admits of no conception. The following method is better adapted to the object, as it offers a sensible image of the manner in which the product of two numbers is formed. To make it better understood, we shall apply it at first to the numbers 5 and 3.

If the figure 1 be written 5 times upon the same line, and two similar lines be ranged underneath the first, as may be seen below,

```

1   1   1   1   1
1   1   1   1   1
1   1   1   1   1

```

the entire number of the figures 1 will be composed of as many times 5 as there are lines; that is to say, of 3 times 5; but by the disposition of these lines, the figures 1 are ranged in columns, each of which contain 3 of them; on counting them in this manner, there will be found to be as many times 3 units as there are columns, or 5 times 3 units, and the result not depending at all upon the manner of counting, it follows that 3 times 5, and 5 times 3 give the same product. It would be easy to extend this reasoning to any numbers whatever, by supposing each line to contain as many units as there are in the multiplicand, and that a number of lines equal to the number of units in the multiplier, be ranged under each other beneath. In reckoning then the product by

lines, it will be found to result from the multiplicand repeated as many times as there are units in the multiplier; but the collection of figures when written presents as many columns as there are units in one line, and each column contains as many units as there are lines: if then it be thought proper to count by columns, the number of lines of the multiplier must be repeated as many times as there are units in a line, that is, as many times as the multiplicand expresses. It is therefore allowed, in the formation of the product of any two numbers whatever, to take for the multiplier, either of the numbers at pleasure.

The reasoning that has just been followed to show the truth of the preceding proposition, is the demonstration of it; and it should be carefully remarked that what constitutes the essence of the method pursued in pure mathematics, is that there is allowed in them no proposition or procedure which is not the necessary consequence of the first notions upon which the whole is founded, and of which the truth is not established in general by reasonings independent of particular examples that can never amount to a proof, and that only serve to render more easy to the reader, the understanding of the reasoning on the practice of the rules.

After knowing all the products given by the first nine numbers when combined with one another, any number whatever may be multiplied by a number expressed with a single figure, by forming successively the products of the units of each rank in the multiplicand with the multiplier; and the operation disposes itself in the following manner.

$$\begin{array}{r} 526 \\ 7 \\ \hline 3682 \end{array}$$

The product of the 6 units of the multiplicand by the multiplier 7, being 42, the 2 units only are written and the 4 tens are retained to be joined to the figures which are next to be met with;—the product of the 2 tens of the multiplicand by the multiplier 7, is 14, and on adding to it the 4 tens previously retained, the number 18 is formed, of which the units only are written, and the ten is retained for the succeeding operation.

The product of the 5 hundreds of the multiplicand by the multiplier 7, is 35; with the ten before retained added, it becomes 36, and must be set down entire, because there are no more figures in the multiplicand.

This process may be thus expressed: *To multiply a number composed of several figures by a number expressed by a single one, the multiplier must be placed under the units of the multiplicand, and a line should be drawn underneath these numbers to separate them from the product; the units of each rank in the multiplicand beginning on the right, must be multiplied by*

the multiplier; the entire product should be set down when it does not exceed 9, but if it contains tens, they must be retained in order to be joined to the following product, and the operation is to be continued in the same manner as far as the last figure on the left of the multiplicand, the result of which must be set down precisely as it may be found. It is evident, that when the multiplicand is terminated by cyphers, the operation cannot begin except at the first significant figure of this number, but in order to give to the product the value it should possess, as many cyphers must be placed on its right as there may be found on the right of the multiplicand. With regard to whatever cyphers may be placed between the figures of the multiplicand, they give no product, and consequently a cypher must always be set down, when nothing has been retained from the product preceding.

The following examples will illustrate the rules.

956	8200	7012	80970
6	9	5	4
5736	73800	35060	323880

New-York, August 4, 1817.

COLUMBIA COLLEGE.

COLLEGIATE HONOURS.

Yesterday being the commencement of Columbia College, the president, trustees, professors, students, &c. proceeded in procession from the College to Trinity Church; where the students of the Senior Class delivered suitable orations, previous to academic honours being conferred on them.

The degree of Bachelor of Arts was conferred on Henry James Anderson, Wm. Beach Lawrence, Peter Forrester, Alexander B. McLeod, Richard Frederick Kemble, Gerard W. Morris, Clarence D. Sackett, George D. Post, James Lenox, Abraham D. Wilson, Daniel Bonnett, Henry Hone, Richard Varick Dey, John H. Lloyd, John O'Brien, Frederick Fairlie, Robert Gracie, Wm. Stayley.

The degree of Master of Arts was conferred on the Rev. John M'Vickar, professor of rhetoric, belles lettres, &c. in Columbia College; the Rev. Samuel Nichols, John B. Beck, M. D. Jacob A. Robertson, Thomas C. Murray, Wm. S. Heyer, John L. Mason, Henry A. Van Amringe, Philip K. Lawrence, Robert C. Sands.

We observe that Columbia College is undergoing very considerable repairs to the main building, an additional wing has been added on the eastern side, and a corresponding wing is immediately to be built on the western side of the college.

We are also happy to observe that the number of students are yearly increasing. Nearly fifty entered the Freshman class last autumn, and about the same number, we are assured, will enter at the termination of the present vacation.—*N. York Gaz.*

At the late annual commencement of Columbia college, the degree of doctor of laws was conferred on the honourable Joseph Hopkinson, of Philadelphia, and on Robert Adrian, professor of mathematics and natural philosophy in Columbia college; and that of doctor of divinity on the Rev. Andrew Thomson, of Edinburgh.—*N. York Columbian.*

UNION COLLEGE.

Schenectady, July 29, 1818.

The late anniversary commencement of this institution, was attended by a very polite and crowded audience. We shall not attempt to discriminate between the different performances of that day. This much, however, may in truth be said, that the Orations, &c. partook more of the American character and spirit, than is usual on similar occasions.

The degree of *Bachelor of Arts* was conferred on the following young gentlemen—John H. Bird, Anthony Blanchard, Simeon D. W. Bloodgood, George S. Boardman, Sidney Breese, David Brigham, William S. Burt, William R. Cantine, Frederick Center, Charles A. Clinton, Henry S. Cole, Sohn T. Cooper, Jacob V. S. De Ridder, Jonathan Dickerson, George W. Doan, Clarkson Dunn, William R. Elmendorf, George K. Fuller, Yorick S. Gordon, Sewall Harding, Lyman G. Harkness, William Holland, Alfred A. Holley, William Jarvis, Charles C. King, Benjamin F. Langdon, Henry Livingston, Gabriel W. Ludlum, Joel Manning, Alexander M'Farland, Peter M'Vickar, William Miller, E. Thomas Parsons, Aaron Pickett, Augustus S. Porter, Alonzo Porter, John W. Proudfit, Charles Rodgers, Henry M. Robseboom, Peter B. Rouse, William S. Sears, Noah C. Sexton, George W. Smith, George W. L. Smith, James B. Ten Eyck, John M. Todd, John Van Beuren, Samuel Van Vechten, Daniel Waterbury, Zolva Whitmore, Elhanan Williams, Henry C. Yates.

The degree of *Master of Arts* was conferred on the following gentlemen—D. C. M'Laren, E. M. Coe, H. Chester, S. Johnson, R. M. Blatchford, T. W. Blatchford, Chester Chapin graduate of Brown's university, Guy W. Doan, Christopher Y. Lansing, John M'Lean, jun. Nathaniel P. Tallmadge, Dudley Selden, Ashbel Webster, Charles Webster.—*Albany Gazette.*

UNIVERSITY OF NORTH-CAROLINA.

On Wednesday, upon the close of the examination at Chapel Hill, the degree of *Bachelor of Arts* was conferred on the following graduates:

William Mercer Green, Thomas Jefferson Green, Robert Donaldson, James Knox Polk. Robert Hall Morrison, Elam Johnston Morrison, Pleasant Hugh May, Edward Jones Mallett, Hugh Dunning Waddell, Arthur John Hill, Hamilton Chamberlain Jones, Peter Oliver Picot, William Mosely.—*Ral. Min.*

WILLIAMS COLLEGE.

Friday, August 14, 1818.

The requisites for admission are a thorough knowledge of the grammar of the Latin language, and of the Greek, including prosody; ability to construe and parse any part of Virgil, Cicero's select orations, Cæsar's commentaries, and the Greek testament, and to translate English into Latin correctly; a knowledge of English grammar and arithmetic; and testimonials of good moral character.

AUTHORS READ BY THE CLASSES.

Freshmen.—Livy, five first books; Horace, the expurgated edition; Dalzel's collectanea, Græca minora and majora; Adam's Roman antiquities; Murray's English grammar; Morse's geography abridged; one vol. 8vo.; Webber's arithmetic, and Day's algebra.

Sophomores.—Tytler's elements of history, Blair's rhetoric, Hodge's logic, Walker on elocution, Playfair's euclid, Day's trigonometry, Cicero de oratore, and Neilson's Greek exercises.

Juniors.—Enfield's natural philosophy, Flint's surveying, Day's mensuration, navigation, conic sections, spherics and fluxions; conversations on chemistry, Paley's evidences, and excerpta latina.

Seniors.—Locke's essay abridged, Stewart's philosophy of the human mind, 2 vols.; Edwards on the will, Paley's moral and political philosophy and natural theology; anatomy, one vol. 8vo. from the Edinburgh encyclopædia; Vattel's law of nations, and Vincent on the catechism.

Books which are continued from one year to another, are mentioned only under the year in which they are introduced.

COURSE OF STUDY.

FIRST YEAR.

- Term 1.* Livy, Græca minora and Roman antiquities.
 2. Horace, Græca majora, and American geography.
 3. Horace, Græca majora, algebra, and review of English grammar and arithmetic.

SECOND YEAR.

- Term 1.* Elocution, Greek, Latin, rhetoric and eastern geography.
 2. History, algebra, geometry, and Cicero de oratore.
 3. History, mathematics, and Latin.

THIRD YEAR.

- Term 1.* Latin, Greek, chemistry, mathematics, and natural philosophy.

2. Latin, chemistry, mathematics, and natural philosophy.
3. Latin, Greek, mathematics, natural philosophy, and evidences of christianity.

FOURTH YEAR.

- Term 1.* Philosophy of rhetoric and philosophy of mind.
2. Moral and political philosophy, Edwards on the will, and anatomy.
 3. Natural theology, and law of nations.

Other exercises.—Declamation and composition, during the whole college course. A critical exercise in the Greek testament weekly, during some part of each year. Translation from one language to another, during the first two years, and disputation during the other two. A theological exercise every Saturday, in Vincent on catechism, and monthly a forensic disputation by the senior class.

Lectures on chemistry are given during the first and second terms. Attendance is required of the juniors, and permitted to the seniors. Experimental lectures are given to the juniors while reading Enfield. Public lectures are given by the professor of divinity, the professor of mathematics and natural philosophy, and the professor of languages.

Commencement is on the first Wednesday in September. The first vacation is from commencement three weeks; the second from the fourth Wednesday in December seven weeks; the third from the third Wednesday in May three weeks. There are three terms in a year. The tuition for each term is seven dollars. Term-bills, including tuition, room-rent, library, &c. &c. are usually less than ten dollars. Board is from one dollar seventy-five cents to two dollars a week, usually two dollars.

By order of the trustees,

ZEPH. SWIFT MOORE, Pres.

Albany Argus.

ACADEMICAL HONOURS.

*Williamsborough Academy, Granville, North Carolina,
June 19, 1818.*

THE Examination of the Students of this Institution began on Monday the 1st, and ended the 6th inst. The Trustees feel a pleasure in announcing to Parents and Guardians the approved progress and critical accuracy of the pupils in their several studies, highly satisfactory to all who were present, and gave ample testimony of the attention and abilities of the professors. The System of Education adopted and pursued in this Seminary, is calculated to make accurate and critical Scholars, which will enable those who design to finish their Education in the University, or any other College, to be admitted into any of the classes with good acceptance

and scholarship. The names of the Students who merited and received the honours at the examination, are Joel Holliman, William Hare, James Jordan, Benjamin Hare, Benjamin Love, Samuel Goode, Spencer O. Brien, Robert Martin, George Ferry, Jno. and Alexander Knox, in the Male department.—Miss Ann Bullock, Lucy F. Lyne, Sarah Hare, Caroline Hunt, Frances Taylor, and Eliza Slade in the Female department.

The exercises of the Institution are under the care of Andrew Rhea, A. M. as principal of the male department—and Miss Bryant, from New-York, as principal of the female department. The superior qualifications and long experience of Mr. Rhea as a Teacher are so generally known, that it is at this time unnecessary to say any thing in favour of them:—they certainly are such as entitle him to public confidence and patronage. If a correct deportment with a perfect knowledge of the various branches taught, combined with unwearied attention to the improvement of her pupils merit applause—Miss Bryant is entitled to it. The Trustees flatter themselves that the qualifications of the Teachers, the healthiness of the place, the society and morals of the Village and its vicinity, will be a sufficient inducement for parents and Guardians to encourage this Seminary.

William Robards, Sec'y of the Board.

N. C. Star.

TO CORRESPONDENTS.

"A Parent" on "the Deaf and Dumb" shall receive due attention in our next number. We hail the spirit that is manifested among our citizens, of extending charity to an institution so noble in its nature as this; we rejoice that men of talents have engaged not only in support of its cause, but also, in support of a solid system of education in our schools and colleges. May their best wishes be realized!

We had prepared for this number, a review of a General atlas by Tanner, Vallance, Kearney & Co, of Philadelphia, which is executed in the most elegant style. It reflects honour on its publishers, and is well worthy the patronage of our citizens, the preceptors of schools, and professors of colleges. The first number has appeared; and the most exact inspection will not derogate from its merits. Press of matter, however, has excluded the article, but we shall, in a future paper, enter into a detail of its merits.

We have received several communications relative to Collegiate and Academical examinations, from the South and West, and the names of those who have honourably graduated. We solicit a continuance of these favours. We are rejoiced to see so laudable a zeal in the cause of education displayed, in every section of our extending empire.

Our own College, shall not be forgotten. Columbia College is rising into deserved estimation, and as long as we have professors of as approved talents as those who preside over that institution, it must claim a prerogative over most other collegiate establishments.